A Guinea for a Guinea Pig: A Manuscript Satire on England's First Animal-Human Blood Transfusion[1]

Utilis est rubri, qvæ fit, transfusio succi,

At metus est, homo ne candida fiat ovis.

Thomas Bartholin, 'De Transfusoria Chirurgia ad Eundem'[2]

Seventeenth-century experiments on blood transfusion represent a well-researched episode in the history of science and medicine.[3] However, the imaginative output that arose out of this new scientific development remains principally unexamined and lost in manuscripts. From the twenty-first century perspective, these texts occupy the hybrid space between literature and science, sporting form and content that is a combination of literary skill and contemporary scientific knowledge. As such, these poems elude the attentions of historians of science and literary scholars alike, with the former lacking a scientific background needed for the analysis and the latter lacking training in literary criticism.[4] By combining the strengths of the two fields, we can discover how early modern literary texts and transfusion experiments

[1] I am indebted to COFUND and Durham University whose generous fellowship made the research for this article possible. Special thanks go to Peter Boughton, Mandy Green, Richard Maber and Iva Polak for their valuable help and advice.

[2] 'On the Transfusional Operation Addressed to the Same [Dr. Joel Langelott].' The transfusion of the red liquid is useful when it happens,/But the fear is that the human might become a white sheep. Thomas Bartholin, *Carmina varii argumenti* (Copenhagen: Henricus Gödianus, 1669), Epigram XCII, Book 7, p. 216. Trans. mine.

[3] For the origins and history of blood transfusion, see Robert G. Frank Jr., *Harvey and the Oxford Physiologists* (Berkeley, CA: University of California Press, 1980), 169-78; Geoffrey Keynes, 'The History of Blood Transfusion', in Keynes (ed.), *Blood Transfusion* (Bristol: John Wright, 1949), 1-40; Marie Boas Hall, *Promoting Experimental Learning: Experiment and the Royal Society 1660-1727* (Cambridge: Cambridge UP, 1991); Marjorie Hope Nicolson, *Pepys' Diary and the New Science*, 55-99 (Charlottesville: UP of Virginia, 1965); N. S. R. Maluf, 'History of Blood Transfusion,' *Journal of the History of Medicine* 9 (1954), 59-107; Charles Webster, 'The Origins of Blood Transfusion: A Reassessment,' *Medical History* 15 (1971), 387-92; Eduardo Fastag, Joseph Varon and George Sternbach, 'Richard Lower: The Origins of Blood Transfusion,' *The Journal of Emergency Medicine* 44 (2013), 1146-1150. For the first animal-human transfusions, see A. Rupert and Marie Boas Hall, 'The First Human Blood Transfusion: Priority Disputes,' *Medical History* 24 (1980), 461-5; A. D. Farr, 'The First Human Blood Transfusion,' *Medical History* 24 (1980): 143-62; Harcourt Brown, 'Jean Denis and Transfusion of Blood, Paris, 1667-1668,' *Isis* 39 (1948), 15-29.

[4] See Claire Preston, *The Poetics of Scientific Investigation in Seventeenth-Century England* (Oxford: Oxford UP, 2015).

shaped each other. Early modern authors received an 'injection' of inspiration from hen-hen, pigeon-pigeon, dog-dog, calf-sheep, lamb-fox, and lamb-human transfusions. Blood flowed freely between beasts, fowl, and humans, just as scientific ideas flowed freely through a variety of literary genres. Contemporary poems and plays show how blood transfusion itself was 'transfused' into literature and how it influenced the choice of poetic devices. They also illuminate the moral and practical issues that lay at the heart of contemporary transfusion experiments. Is the exchange of blood between humans and animals an ungodly act, a re-engineering of a human being made in God's image, as Allan Chapman has suggested?[5] From which social categories should human subjects be selected for these experiments? Are these persons capable of giving informed consent?

An imaginative response to these troubling questions lies in an anonymous undated poem 'On Agnus Coga his Povertie' (1668?), found in the Egerton MS 2982 in the British Library, in Vol. V of Heath and Verney Papers, which contains miscellaneous theological and literary works from the seventeenth century. [6] This long satiric poem documents the first sheep-to-man blood transfusion performed at the Royal Society on 23 November 1667, on one Arthur Coga.[7] The poem, transcribed at the end of this article, tackles crucial ethical points of medical experimentation in the period. The problems of scientific exploitation, complicity, and informed consent – what today we would call bio-ethics – are dealt with the use of realised metaphors, local legends, biblical stories, and classical mythology. Simultaneously, the scientific procedure of blood transfusion helps to engineer a poem that is built on layers and layers of transformations.

[5] Allan Chapman, *Physicians, Plagues and Progress: The History of Western Medicine from Antiquity to Antibiotics* (Oxford: Lion Books, 2016), 235.
[6] Simon Schaffer mentions the poem in 'The Body of Natural Philosophers in Restoration England,' in Christopher Lawrence and Steven Shapin (eds.), *Science Incarnate: Historical Embodiments of Natural Knowledge* (Chicago: University of Chicago Press, 1998), 104.
[7] Anon., 'On Agnus Coga his Povertie,' Egerton MS 2982 (Heath and Verney Papers Vol. V), British Library, ff. 162-3.

By receiving blood from a sheep, Arthur Coga, a demented clergyman and alcoholic, undergoes a transformation into Agnus, whereby his gullible nature receives a suitable physical form and fulfills the prophecy of the epigraph to this article. It is worthwhile to give a brief sketch of the history of transfusion to provide the context for this story of one 'Who by Philosophical Transfusion of Sheepsbloud became Heart-less and Shift-less, after his unpitied Addresse to the Royal Societie,' as the subtitle has it.

The German chemist Andreas Libavius provided the first detailed description of a possible transfusion technique in 1615, but he is unlikely to have attempted it.[8] The first victims of this '*Neoterick* Invention of *Transfusion of Blood*'[9] were chickens in a rectory in Somerset, on whom the Vicar Francis Potter (1594-1678) made a series of unsuccessful experiments from 1650 to 1653.[10] Potter's project was based on William Harvey's discovery of the circulation of the blood in 1616. Several years later, in 1656, Christopher Wren (1632-1723) began his trialling of intravenous injections on dogs in Oxford. Injection became a standard experimental procedure as an imaginative array of liquids – opium, milk, broth, wine, ale, and poison, among others – found their way into canine veins.[11] A decade later, in 1666, the skilled anatomist Dr. Richard Lower (1631-1691) performed the first successful transfusion between animals, namely two dogs.[12] The development of animal transfusion led naturally to the proposition for a human blood transfusion. However, here the English were surpassed by the Frenchman Jean Denis (1635-1704), physician to Louis XIV, who successfully transfused sheep's blood into a 15-year old boy in June 1667.[13] Nevertheless, in

[8] Andreas Libavius, *Appendix necessaria syntagmatis arcanorum chymicorum* (Frankfurt: s.n., 1615), IV.8. Instead of an artery-to-vein blood transfusion, Libavius proposed to transfuse the blood from the artery of the donor to the artery of the recipient. This technique would impede blood flow because of equal blood pressure in the arteries, making transfusion altogether impossible.
[9] G. S. *The Hydrostaticks* (Edinburgh: George Swintoun et al., 1672), 251.
[10] Charles Webster, 'The Origins of Blood Transfusion: A Reassessment,' *Medical History* 15 (1971), 387-92.
[11] See J. A. Bennett, *The Mathematical Science of Christopher Wren* (Cambridge: Cambridge UP, 1982), 77-82.
[12] The 'recipe' for the procedure is found in Richard Lower, 'The success of the experiment of transfusing the bloud of one animal into another,' *Philosophical Transactions* (17 Dec, 1666), 353-8.
[13] Jean Denis, 'A letter concerning a new way of curing sundry diseases by transfusion of blood,' *Philosophical Transactions* (22 July 1667), 489-504.

November of the same year, Dr. Edmund King (bap. 1630-1709) and Dr. Lower prepared to follow suit and perform the first human blood transfusion in England.

Finding a suitable human subject for the experiment was trickier than choosing a dog or a fox. Sir George Ent (1604-1689), Fellow of the Royal Society, 'thought it most adviseable to try it upon some mad person in the hospital of Bethlem.'[14] The bad and the mad had the ill fortune of being desirable human subjects for scientific experiments in the period.[15] Lower, King, and two other Fellows arranged a meeting with Dr. Thomas Allen, the manager of Bedlam. Allen, however, refused the request on the grounds of moral scruples.[16] The doctor's reaction points to the alarming nature of the new physiological experiments and to his sense of his patient's rights. Lower then approached Arthur Coga, a supposedly mentally disturbed clergyman in his thirties, formerly a student at Pembroke College, Cambridge.[17] 'A little frantic,'[18] but physically healthy, Coga seemed a perfect choice for testing the hypothesised therapeutic effects of transfusion. Was transfusion 'an obvious Remedy,' whereby 'the *peccant Blood* may be drawn out, without the danger of too much *enfeebling* Nature,' as Joseph Glanvill proposed?[19] Could the introduction of a lamb's blood into Coga's circulation cool his own heated blood and brains? Eager to find out the answer, the experimenters offered Coga a guinea to become their guinea pig.

On Saturday 23 November 1667, around ten or eleven in the morning, a crowd of over forty spectators gathered at Arundel House, the new home of the Royal Society after the

[14] Thomas Birch, *The History of the Royal Society of London* (London: A. Millar, 1760), 2:202.
[15] Condemned criminals frequently suffered 'the second death' of dissection at the hands of the anatomists. Denis Dodart, Doctor of the Medical Faculty in Paris, even advocated in 1676 the testing of drugs on live bodies of criminals condemned to death, while Timothy Clarke and Christopher Wren injected an infusion of *crocus metallorum* into 'an inferior Domestick' of the French Ambassador that 'deserv'd to have been hang'd.' Denis Dodart, *Mémoires pour servir à l'histoire des plantes* (Paris: 1676), 10; Robert Boyle, *Some Considerations Touching the Usefulnesse of Experimental Naturall Philosophy* (Oxford: Henry Hall, 1663), Part II, 64.
[16] Birch, 2:204.
[17] Details about Coga from John Venn and John Archibald Venn, *Alumni Cantabrigienses*, 6 vols (Cambridge: Cambridge UP, 1922-1954), 1:365.
[18] Samuel Pepys, *Diary*, 8:543 (21 Nov 1667).
[19] Joseph Glanvill, *Plus Ultra* (London: James Collins, 1668), 17. Emphasis in the original.

Great Fire of London.[20] Among the audience were many physicians, divines (including the Bishop of Salisbury), and MPs, as well as the Howard family, owners of Arundel House.[21] Lower and King inserted a silver pipe fixed with a quill into a young sheep's carotid artery, and let out 12 ounces of its blood. They opened Coga's vein and let out six or seven ounces of blood. After placing a silver pipe into Coga's vein, they joined the two pipes with quills. The sheep's blood ran into Coga's vein for at least two minutes. The experimenters stopped when Coga announced that he had had enough, that is, after half a pint.[22]

Two days after the experiment, William Brouncker, President of the Royal Society, visited Coga in his lodgings. Coga's landlord remarked that Coga had become 'more composed […] than he had been before.'[23] King's report in the *Philosophical Transactions* includes Coga's self-observation:

> The Man *after* this operation, as well as *in* it, found himself very well, and hath given in his own Narrative under his own hand, enlarging more upon the benefit, he thinks, he hath received by it, than we think fit to own as yet. He urged us to have the Experiment repeated upon him within three or four dayes after this; but it was thought advisable, to put it off somewhat longer.[24]

Here King shows care and circumspection and places his patient's wellbeing before his own scientific curiosity: despite Coga's urging for a second experiment, King thinks it best not to be too precipitate. The 'Narrative' referred to is Coga's subjective account of the experiment in Latin which he brought to the Society's next meeting on 28 November. However, the account is never quoted in the documents of the Royal Society.

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[20] Birch, 2:215.
[21] Oldenburg to Boyle, 25 Nov 1667, in Oldenburg, *Correspondence*, 13 vols., eds. A. Rupert Hall and Marie Boas Hall (London: Taylor and Francis, 1965-1986), 3:611.
[22] As reported by Edmund King, 'An account of the experiment of transfusion practised upon a man in London,' *Philosophical Transactions* (23 Nov 1667), 557-9.
[23] Oldenburg to Boyle, 25 Nov 1667, in *Correspondence*, 3:611.
[24] King, *Philosophical Transactions* (9 Dec 1667), 559. Emphasis in the original.

The second transfusion took place on 12 December, 'in the presence of a strange crowd, both of foreigners and domestics.'[25] This time the experiment was to be much more exact: new pipes were designed for the occasion, the emittent sheep was weighed before and after the trial, and an assistant timed the operation. However, the transfusion seems to have gone less smoothly than the first one: King accidentally spilled some blood that he took from Coga's arm, and the quills kept slipping out of the receiver owing to the sheep's struggles. Coga received much more blood than the first time, 14 ounces to be exact. It was judged that 'the wildness of his mind remains unchanged – or perhaps we ought rather to consider that the improvement of his brain is prevented by the incurable intemperance of which he is guilty.'[26] Coga became the butt of jokes in coffeehouses and taverns, spending the fee King paid him on drinks. Philip Skippon reported that 'the effects of the transfusion are not seen, the coffee-houses having endeavoured to debauch the fellow, and so consequently discredit the Royal Society, and make the experiment ridiculous.'[27]

Henry Stubbe, a critic of the Royal Society, expressed his scepticism regarding the efficiency of the experiment: 'Sure I am that the *Transactions* report an *Untruth*, in saying that *Coga* was ever the *better* for it: I am told his Arm was strangely ill after it, and difficultly cured.'[28] Stubbe also printed the following letter addressed to the Society by Coga, now transformed from Arthur to 'Agnus':

> To the Royal Society the VIRTUOSI, and all the Honourable Members of it, the Humble Address of AGNUS COGA.

[25] Oldenburg to Boyle, 17 Dec 1667, in Oldenburg, *Correspondence*, 4:59. The trial is described by King, Royal Society Classified Papers 12 (1), no. 18.
[26] Oldenburg to Boyle, 17 Dec 1667, in Oldenburg, *Correspondence*, 4:59.
[27] Skippon to John Ray, Jan 1668, in Ray, *Correspondence*, ed. Edwin Lankester (London: Ray Society, 1848).
[28] Henry Stubbe, *Plus Ultra Reduced to a Non Plus* (London: s. n., 1670), 133.

> Your Creature (for he was his own man till your Experiment transform'd him into another *species*) amongst those many alterations he finds in his condition, which he thinks himself oblig'd to represent them, finds a decay in his purse as well as his body, and to recruit his spirits is forc't to forfeit his nerves, for so is money as well in peace as warre. 'Tis very miserable, that the want of natural heat should rob him of his artificial too; But such is his case; to repair his own ruines (yours, because made by you) he pawns his cloaths, and dearly purchases your sheeps blood with the loss of his own wooll. In this sheep-wreck't vessel of his, like that of *Argos*, he addresses himself to you for the Golden Fleece. For he thinks it requisite to your Honours, as perfect Metaplasts, to transform him without as well as within. If you oblige him in this, he hath more blood still at your service, provided it may be his own, that it may be the nobler sacrifice.
>
> *The meanest of your Flock,*
>
> *AGNUS COGA.*[29]

Coga represents himself as a victim: he has lost autonomy over his body to the *metaplasts* ('transformers'), that is, the experimental philosophers, who transformed him into 'another *species*.' Interestingly, in the manuscript version of the letter, this expression is crossed out and a more dramatic 'beast' is written above it. Coga reports 'many alterations' in his condition and 'decay' in his body. The validity of his complaints cannot be verified, but by all accounts, he should have been dead after the first transfusion. Sheep blood is wholly incompatible with human blood, and the transfusion should have caused anaphylaxis, a serious allergic reaction.[30] In any case, Coga complains that the Royal Society has caused him ill health and financial predicament. The loss of money and the consequent pawning of his clothes lead to the realised metaphor that will be exploited by the poem: Coga's transformation has only been partially successful as he has become a stark-naked sheep, with

[29] Stubbe, *Legends No Histories* (London: s. n., 1670), 179. Emphasis in the original.
[30] Chapman has argued that there is a possibility that it was the sheep that received Coga's blood and not the other way around. This is owing to the differences in blood pressure: human blood pressure is usually slightly higher than that of a sheep, and especially so in the case of a heavy drinker. Chapman, *Physicians, Plagues and Progress*, 235.

no wool on his back. Not even a 'Sheep's Tail did soon emerge or arise from his Anus,'[31] as it did in Thomas Shadwell's *Virtuoso* (1676).

Coga's self-portrayal as the experimenters' guinea pig constitutes an invaluable comment on the early modern experimental practice. The letter is appended to the manuscript poem, which further develops its premise. Both texts show conscious awareness of the problem of using a human being as a site of experimentation. The experimental philosophers are exposed as unscrupulous scientists that take advantage of 'indigent' persons. In Henry Oldenburg's letter to Robert Boyle, Coga is portrayed as 'an indigent p[erson], and receiving a Guinea for undergoing the experiment; which reward maketh him willing to have it repeated upon him, wherein he will easily be complied with, and that, I think, before the end of this very week.'[32] Oldenburg, probably especially eager to make an impression as a recent FRS, shows interest in getting Coga to cooperate for money.

Not only does the poem function as a satiric testimony of the experimental culture of the times, making it a valuable contribution to the social history of science and medicine, but it also shows how the transformative space of poetry incorporated the scientific procedure of blood transfusion. This incorporation can best be seen in the organising element of the entire poem, and that is the *metaplasm*, already mentioned in the above letter. Originally a rhetorical term, 'metaplasm' connotes a transformation of a word *metri causa*. The poem plays with this concept and combines it with the notion of plasticity, which was a favourite and mockable scientific term at the time. The bodies in the poem become 'plastic' as they undergo a series of transformations. This poetic procedure imitates the scientific procedure of the blood transfusion, in which the blood of the receiving human was supposed to take on the

[31] Thomas Shadwell, *The Virtuoso* (London: Henry Herringman, 1676), II.ii.
[32] Oldenburg to Boyle, 25 Nov 1667, in Oldenburg, *Correspondence*, 3:613.

qualities of the donor animal. The following analysis will show how the poem acts as a site of *metaplasms*, both rhetorical and physical.

The science of transfusion dictates the poem's main realised metaphor, the literal transformation of a man into a sheep. Ovid's *Metamorphoses* offers itself as the most obvious source for the poem's intertext. Throughout the poem, classical mythology is intertwined with local legends and placed in the service of satire. The author hurls us into the world of transubstantiation, where the qualities of one living being are transfused into another through the bloodstream. The mock-heroic mode is firmly established from the beginning:

> That Metamorphosis did once translate
> Men into Beasts, and fired by Subtle Fate
> Is read, Vogue'd up again in Greshams School,
> And practic'd on a Gotham-Colledg Fool,
> Is now reviv'd. For by a Misterie deep
> Our Fox-like Coga creeps into a sheep:
> And that same Sheepishness transfusd into
> His body, hath transformd him Sheepish too:
> Hee's no Lycaon Wolf, Actæon Stag,
> But a pure Balamite, or Sheepish Wag. (1-10)

Blood transfusion is seen as a vogue (3), which diminishes its scientific importance and emphasises the problem of it being 'practic'd' (4) on a human subject. Coga is brought into connection with Gotham, a village whose inhabitants are proverbial for their want of wit. Their ventures are described in Andrew Boorde's *Merie tales of the made men of Gotham* (1565), which includes ridiculous tales of how the villagers attempted to contain a cuckoo by circling it with a hedge, and drown an ill-behaved eel in a pond as revenge for eating all their

fish.[33] Coga is cast as a witless patient, 'a Gotham-Colledg Fool' (4), suitable for a medical experiment. The blood transfusion works in mock-religious language 'by a Misterie deep' (5). Coga himself used a religious argument to explain why he took blood from a sheep and not any other animal: *Sanguis ovis symbolicam quandam facultatem habet cum sanguine Christi, quia Christus est agnus Dei* (the blood of a sheep has certain symbolic power like the blood of Christ, for Christ is the lamb of God).[34] The 'sheepish' blood cells are 'mysteriously' carried into Coga's body. But unlike Lycaon's metamorphosis into a wolf or Actæon's into a stag, Coga's is a less than glamorous transformation into a sheep. The sheep is likewise infused with human qualities as Coga, in a powerfully graphic language, 'creeps into' it (6). The real sheep might have indeed received blood from Coga and become inebriated from his brandy-filled veins.[35]

Given the unifying theme of bodily transformations in the *Metamorphoses*, it is unsurprising that Ovid was frequently brought into connection with transfusion in the seventeenth century. Potter is even said to have received the inspiration for his chicken experiments from the Roman author, which reinforces the claim that there was a two-way traffic between transfusion and poetry in the period. John Aubrey reports that 'the hint came into his head reflecting on Ovid's story of Medea and Aeson,'[36] in which Medea prepares a mixture of roots, animal blood and entrails in a cauldron, and rejuvenates Aeson:

stricto Medea recludit

ense senis iugulum veteremque exire cruorem

passa replet sucis[37] (7.285-7)

[33] Andrew Boorde, *Merie tales of the made men of Gotham* (London: 1565/1690).
[34] Birch, 2:216. Trans. mine.
[35] See Chapman, 235.
[36] John Aubrey, in *Brief Lives*, 2 vols, ed. Kate Bennett, (Oxford: Oxford UP, 2015), I.189.
[37] Ovid, *Metamorphoses*, Books 1-8 (Cambridge, MA: Harvard UP, 1977).

unsheathing her knife, Medea

cuts the old man's throat and letting the old blood run out

she refills him with juices[38]

In the poem, Coga is 'refilled' with sheepish juices. Unlike in Ovid's tale, in the scientifically progressive seventeenth century no supernatural power is needed to effect a physical transformation. The experimental philosopher takes the place of 'a *God* or *Witch*,' as Simon Ford recognises in his poem on the conflagration of London, written in the year of the transfusion experiments on Coga:

He too, that *sung chang'd shapes*, might hence enrich

His *Muse*, without a *God* or *Witch*.

Here, *empty'd Veins* with *blood adopted* swell

And *Souls* in *Foreign Bodies* dwell[39]

Ovid's fictional stories can now be enriched by real stories from the world of science. Coga's 'empty'd Veins' swell with the 'blood adopted' from a sheep and radically change his constitution. Contemporary writers were quick to seize on the satiric possibilities offered by inter- and cross-species blood transfusions and accompanying metempsychosis, or the transmigration of the soul. Popularised by Pythagoras and underlying Book XV of the *Metamorphoses,* this theory argues that when a body dies, its soul migrates to another body. The barriers between animal species are fluid in this system so the soul can inhabit the body of a different species than the one to which it originally belonged.[40] In *Tarugo's Wiles* (1668), a play by Thomas St Serfe, a group of customers are chatting in a coffee house,

[38] Trans. mine.

[39] Simon Ford, *Three Poems relating to the late dreadful destruction of the city of London by fire* (London: Sa. Gellibrand, 1667), 14. Emphasis in the original.

[40] See Peter Harrison, 'Animal Souls, Metempsychosis, and Theodicy in Seventeenth-Century English Thought,' *Journal of the History of Philosophy*, 31 (1993), 519-44.

discussing the current experiments of transfusion. One customer claims that a transfusion of a goat's blood enables him to climb cliffs in search of jackdaws' nests and that a young hog's blood would make an old man a teenager. Another customer states that he witnessed a castrated ram receive blood from a bull-calf and immediately mount a mare. The third tells of an old usurer who received blood from a young Welsh thief in order to become rejuvenated, but suffered the unwanted side effect of taking to stealing.[41] The idea that blood carried vital principles and determined the behaviour of the organism was prevalent in the period, as evidenced by this story recounted by Thomas Bartholin (1616-1680):

> *Nam ad sanguinis condicionem mores efformantur. Puella quaedam Uratislaviensis Epileptica, ebibito sanguine felino, felis naturam induit ex intervallo, & quod id animal in aedibus solet, imitabatur, voce, saltu, gestu, vestigiis, mures in silentio venata in angustissimis etiam foraminibus.* (15)[42]
>
> For behaviour is formed according to the nature of the blood. An epileptic girl from Wrocław, after she had drunk feline blood, took on the nature of a cat after some time, & what this animal is wont to do at home, she would imitate, in her voice, jumps, gestures, steps, and she even went mouse-hunting, silently, in the narrowest of holes.[43]

Bartholin was a Professor of Anatomy at the University of Copenhagen, which was at the forefront of anatomical research in seventeenth-century Europe. Margaret Cavendish believed the story to be true and followed it with stories of a man who took pleasure in wallowing in the mire after drinking swine's blood, and of a girl who skipped and grazed trees like a goat after drinking goat's blood.[44]

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[41] Thomas St Serfe, *Tarugo's Wiles: Or, the Coffee-House* (London: Henry Herringman, 1668), Act III.
[42] Thomas Bartholin, *De sanguine vetito disquisitio medica* (Frankfurt: Haubold, 1673).
[43] Trans. mine.
[44] Margaret Cavendish, 'Letter XXXII,' in *Philosophical Letters: Or, modest reflections upon some opinions in natural philosophy* (London: s.n., 1664), 228-9.

After the poem's introduction into the world of metamorphosis, the hierarchy of the experimenter-patient relationship is suddenly disrupted as Coga's scarlet robes 'proclame him Doctor oth' Societie/Roial' (15-16). In the seventeenth century, doctors' gowns were of scarlet cloth. By being 'perhaps as wise too' (17), Coga comes dangerously close to the experimenters. The simile turns on its head as we realise that their common denominator is madness and not wisdom: it is the experimenters who are like Coga, and not the other way round. As Erika Dyck and Larry Stewart put it, 'a bedlamite character could just as readily be attached to the experimenter as much as to the unfortunate subject.'[45] In other words, the doctor is as mad as the patient. The doggerel verse of James Carkesse, who was treated by the same doctor that refused to procure patients for Lower and King's experiments in transfusion, plays a similar game with the concept of madness. Carkesse, an inmate of Dr. Allen's private asylum at Finsbury and later at Bedlam, casts the patient as the one 'who more *Wit* than the *Doctor* had.'[46] The authority of Coga's physicians and their claim to knowledge is likewise shaken.

Not paid enough for his participation in the experiment – 'he now scarce knows/How for his old to purchase newer Cloathes' (17-18) – Coga is left to freeze. This financial loss gives rise to the idea that the transformation into a sheep was only partially successful: the patient has been stripped of his clothes but no wool has grown to replace them. To illustrate this point, the author draws on a folk legend, exclaiming in a mock-poetic strain:

Alas Poor Lamb! thy Metaplasts did lack
That Skil to make the Wool grow on thy back,
As had the Hampshire Knight whose Pegasus

[45] Erika Dyck and Larry Stewart, 'Introduction,' in Dyck and Stewart (eds.), *The Uses of Humans in Experiment: Perspectives from the 17th to the 20th Century* (Leiden: Brill, 2016), 11.
[46] James Carkesse, 'The Patients Advice to the Doctor,' in *Lucida Intervalla: Containing divers miscellaneous poems, written at Finsbury and Bethlem by the doctors patient extraordinary* (London: s.n., 1679), 39.

When flead and cloath'd with fresh warm Sheeps-skins, thus

Reviv'd and thriv'd so wel that every year

Ten Todd of Wool at Sheering he did bear. (21-6)

The story of the 'sheepish' horse is found in Scottish and Irish folklore.[47] According to the legend, the man finds his horse dead by the barrels of mash. He skins the horse and sells the skins, but the very next morning discovers that the horse is alive and that it had simply gotten drunk on mash. The horse is now 'red and raw,'[48] so the man hurries to get the skins from the butcher. He fastens them with willow rods and covers the horse. To the man's surprise, the skins knit together and the horse recovers. Not only that, but the horse also grows a willow grove on its back and gives more wool during shearing time than any sheep.[49]

Unlike the folktale's woolly Pegasus, Coga is left naked due to the experimenters' lack of skill. There follows a list of the various scientific activities of the Royal Society, a frequent feature of other contemporary poems that touch upon experimental philosophy.[50] Among the projects listed are alchemy, antiquarianism, research on textiles, magnetism, atomism, and telescopic observations:

Could they effect the same, this Art alone

Would transcend al their Proiects. Hermes stone,

Panciroll's lost and new-found Rarities, all

Those Extracts from the Art Spagyrical,

Al the Magnetic Feats, and Golden Fleece,

[47] R.A.Q. Skerrett, 'A Tall Tale,' *Studia Celtica*, 10 (1975), 393-400.
[48] Skerrett, 398.
[49] Jennifer Westwood and Sophia Kingshill, *The Lore of Scotland: A Guide to Scottish Legends* (London: Random House, 2009), 389; Christopher Smart, *The Nonpareil; or, the quintessence of wit and humour* (London: T. Carnan, 1757), 207-209. The story is sometimes set in Yorkshire and it survives into the eighteenth century as a tale of Doctor Dove of Doncaster and his nag called Nobbs.
[50] E.g. Robert Gould, *To the Society of the Beaux Esprits* (London: Joseph Knight and Francis Saunders, 1687); F. V., *Detur Pulchriori: Or, a poem in the praise of the university of Oxford* (Oxford: s. n., 1658).

Come short of Artificial Larrifice.
Linnen of Coco-nuts or Barks of Trees
(Tho such are al short of our Tinkers Freize:)
Asbestine Stuff, or Byssine, or whats made
Of Mugwort, Nettle, or such home-spun Trade.
Or comprest Atomes, or fine Gossimere
Which yet by Moderns scarce invented were,
Or Hair made grow upon an Eunichs chin,
And with that Down to quilt our Caps; had bin
More thriving Arts then Telescopes […] (27-41)

The suggestion that the effecting of transfusion would 'transcend al their Proiects' (28) mocks the over-ambition of experimental philosophers, a common satiric target at the time. The scientists follow the patron of alchemy, Hermes, in their spagyrical, that is, alchemical search for the Philosopher's Stone, or the Golden Fleece. They dig through 'Panciroll's lost and new-found Rarities' (29), which refers to one of the most important heurematographies, or books on inventions, written during the sixteenth century, entitled *Rerum memorabilium libri duo quorum prior deperditarum, posterior noviter inventarum est* (1599/1602). Authored by Guido Panciroli (1523-1599), a Professor of Law in Padua and an antiquarian, it was heavily annotated by his student Heinrich Salmuth (ca. 1578-1613), making the work more his than Panciroli's. As Vera Keller notes, the text shaped the research agenda in the early seventeenth century,[51] and it discusses such diverse topics as alchemy, falconry, the new world, sugar, porcelain, clocks, and spectacles. These interests are shared by the virtuosi. The list of natural and artificial fibres used for clothing makes fun of William Petty's research on textiles in his *Discourse concerning the Making of Cloth* and his *Apparatus to the*

[51] Vera Keller, 'Accounting for Invention: Guido Pancirolli's Lost and Found Things and the Development of Desiderata,' *Journal of the History of Ideas* 73 (2012), 223-45.

History of Dying,[52] while 'the Magnetic Feats' (31) refer to the work done on magnetism by the Royal

Society and the universities.[53] The catalogue of projects finishes with 'comprest Atomes' (37), or the atomic theory advanced by Pierre Gassendi, and finally telescopes.

Coga and the experimental philosophers are then thrown into an Ovidian tale:

> It seems these Jasons through Medeas Charms
> Nor Bulls nor Dragons tam'd, or heald thy harms:
> They've sowne no Dragons teeth; nor Argos fraught;
> To sail in Sculler thus is Coga taught. (43-6)

The virtuosi become rather unsuccessful 'Jasons' who perform none of the feats of the Argonauts (yoking a pair of fire-breathing bulls and using them to plough a field which would later be sown with dragons' teeth).[54] At the same time, Coga makes for a ridiculous figure as he paddles about in a tiny sculler instead of travelling on the majestic Argo. There is a pun here on the patient's surname – a cog boat was originally a one-masted trading ship. In Middle English, it became assimilated colloquially to the cock-boat, a much smaller rowing boat, which must be the allusion here. All the high-flown promises come to naught as the experimenters do not manage to 'heal his harms' (44). Once more, Coga is reduced to a character in a fictional story:

> Dismantled thus (pale Ghost!) to Scoggins book
> How like in Decimo Sexto dost thou look!
> A Jeast and Tale al ore ridiculous? (51-3)

[52] See Birch, 1:65.
[53] See William Poole, 'Magnetism and Its Survival,' in *The World Makers: Scientists of the Restoration and the Search for the Origins of the Earth* (Oxford: Peter Lang, 2010), 143-54.
[54] Ovid, *Metamorphoses,* 7.100-158.

Coga is ‘dismantled’ to a ‘Jeast and Tale al ore ridiculous’ (53) in the popular jestbook from the mid-sixteenth century, *Scoggins Iestes*, possibly compiled by the already mentioned Boorde, author of the Gotham tales.[55] John Scoggin is a jester that deceives his victims by pretending innocence. Tricked by the Royal Society ‘Scoggins,’ who profess benevolent intentions, Coga becomes a victim of a cruel joke.

In the second half of the poem, much space is devoted to the embittered condemnation of the experimenters’ conduct. The poet asks:

> In whose service He
> Who lost his Bloud by them should sterved be?
> They dreind thy Bloud, yet thy Wits to thy Greif
> Bleed not their Pocket veins to thy Releif. (55-8)

Strong language connotes Coga’s loss as the verses are sprinkled with the word ‘blood.’ Both his wits and pockets are drained and bled, and he is starved and unrelieved. Serving such masters is far from rewarding, suggests the poem:

> When after al his best Bloud, and Coin, and Pains
> Expended, He nor Cloathes nor Honour gains.
> Such Pay-Masters are cruel, or scarce Good,
> Who for pure Gold repay in Brass or Bloud. (69-72)

The value of these verses lies in their explicit and conscious concern regarding the rights of experimental subjects in a period that knew no codes of patients’ rights or strict procedures

[55] Boorde, *The Geystes of Skoggon* (London: Thomas Colwell, 1565). The first extant edition is *Scoggins Iestes* (London: Raph Blower, 1613).

for informed consent. The poem recognises that the poor, mad, and displaced make an easy target for experimental philosophers as their lack of wits and low social standing allow them to be coaxed into undergoing dangerous medical trials. The experimenters are accused of having taken advantage of Coga: he expends his vital bodily fluid and gains small monetary compensation. Accordingly, Lower and King are portrayed as 'cruel' and 'scarce Good' (71).

Once again, the experimenters and their unfortunate subject take on the roles of fictional characters. After enacting Greek, Roman, and English legends, they suddenly become Cervantes' protagonists:

> Wil thy Quixotic Masters yet nought do?
> Hark, Sancho! take advice and quickly too.
> In their Lycæum, where they (whither right
> Or wrong) run a tilt at th' old Stagirite (73-6)

The experimental philosophers are represented as delusional scientists who champion the ideas of the new natural philosophy while attacking the older Aristotelian philosophy. Their agenda is visualised as a literal attack: in their Lycæum, the hall for public lectures, they 'run a tilt' (76) at Aristotle, in a picaresque manner, not caring much for the truthfulness of their statements but rather for the sheer novelty of their discoveries. Although Dmitri Levitin has convincingly argued against the view that there is a rigid division into the old, theoretical natural philosophy and the new, practical experimental philosophy in the early modern period, [56] this poem relies on just one such simple and rigid binary. Experimental philosophy is not perceived as something that organically arises from the experiential rhetoric of sixteenth-century medical humanists, but as an independent pursuit at odds with what is seen

[56] Dmitri Levitin, *Ancient Wisdom in the Age of the New Science: Histories of Philosophy in England, c. 1640-1700* (Cambridge: Cambridge UP, 2015).

as the more passive, Aristotelian tradition. Such simplifications and divisions into the traditionalists and the *novatores* are favoured by satire, a mode of writing that thrives on establishing a binary difference.

The poem's satirical climax comes when Coga is given new clothing:

> How luckily placet I wis! the Learn'd Arras
> Represents lively Balam and his Asse.
> Hangt; cut it out, it il becomes that Place
> Which wud Thy naked back much better grace,
> With Prophet placet before, and Asse behind (77-81)

Arundel House, where the experiment was performed, occupies a central place in the history of English taste. Owned by Henry Howard, later sixth Duke of Norfolk, the estate stretched three and a half acres along the northern bank of the Thames. Thomas Howard, Henry's grandfather, had used it as a repository of his impressive collection of ancient sculptures, busts, Renaissance paintings, sarcophagi, the famous Arundel marbles, and, relevant here, 'skilful tapestries.'[57] One of these tapestries, or arrases, must have been a depiction of the Old Testament story of the prophet Balaam and his ass (Numbers 22).[58] Angry at Balaam, God sends an angel with a sword in hand to obstruct his path. The donkey sees the angel and swerves out of the way, whereby Balaam punishes it. After being punished three times, the donkey miraculously speaks and complains to Balaam. Balaam's eyes finally open and he sees what the donkey wanted to protect him from. It is suggested that Coga be wrapped into the tapestry, which would show him to be an ass. A possible interpretation of the applicability

[57] H. J. Louw, 'Some Royal and Other Great Houses in England: Extracts from the Journal of Abram Booth,' *Architectural History* 27 (1984), 507.
[58] Extant inventories do not list this particular tapestry, but then again there is no definitive reconstruction of Arundel's collection. The most detailed descriptions of the rooms in Arundel House come from foreign visitors to the Royal Society, but there is no mention of the arras in their accounts. See W. E. Knowles Middleton, 'Some Italian Visitors to the Early Royal Society,' *Notes and Records of the Royal Society* 33 (1979), 157-73.

of this biblical story to the transfusion experiment is that Coga stands for the ass which turned out to have more wits than the prophet, i.e. Lower and King.

The poem ends with Coga's words, or, better said, with his farewell 'Ba–:'

> Judg (kind Spectators!) ist not wel design'd?
> Better to Steal then Sterve: tis Natures Law
> Thus theyl' not but their Tapstrie wear the flaw.
> Ba – quoth the Lamb: I'le bleat in raggd Disdein,
> Ere Ile be hang'd, or Bloud Enobled stein.
> Let them stil keep their prating Asse, whilst I
> With silent Seneca bleed to Death, and die.
> Their Ba-lam yet not midst the Goates but Sheep
> On the Right hand, so I my Station keep. (82-90)

The poem parodies the act of witnessing, which was a warrant for any experimenter's claim to knowledge in the early modern period.[59] Coga renounces the suggested idea of stealing the tapestry and using it as an item of clothing. Instead, he mock-heroically decides to 'bleat' (85) and 'bleed to Death' (88). He compares himself to Seneca the Younger, who cut his veins when Nero ordered him to commit suicide. The experimenters are thus given one final blow by being compared to the ruthless Roman tyrant. The poem ends with a witty consolation that at least Coga is now definitely saved, and is found among the sheep at the right hand of God (Matthew 25:31-6).

With this consolation, our poem finishes its account of an important episode in the history of science and medicine. Owing to its satirical nature, this account is heavily biased and gives a clear-cut, black and white representation of the experimental philosophers and the

[59] See Steven Shapin, 'The House of Experiment in Seventeenth-Century England,' *Isis* 79 (1988), 373-404.

experimental subject. The subject is naïve and meek, and the experimenters are unscrupulous, incompetent, cruel, and tyrannic. The (un)truth of this representation does not diminish the value of the poem as a document of the times. The poem records a contemporary reaction to the questions of morality, money, and complicity in scientific and medical experiments. It is an exquisite illustration of the bioethical consciousness in the time predating the concept of bioethics. The poem engages with the question of determining the parameters of experimentation: Who is a suitable experimental subject? How are they to be repaid? Are some experiments too risky to be tested on anyone? In the light of the latter question, real-life Coga was lucky not to have died like his poetic counterpart. Two of Denis' patients died following the transfusions and the procedure was banned by the French Parliament in 1670.[60] (This edict was followed by the ban from the Pope in 1675, and from the English Parliament in 1678.)

The poem is no less valuable as an example of the early modern interaction between blood transfusion and poetry, which is 'mutually informing and mutually sustaining.'[61] The theories and practices of transfusion play a significant role in engineering this poem, allowing it to be structured around the concept of metaplasm. In addition to responding to these scientific theories and practises, the poem itself carries a transformative power. The author uses a pastiche of classical and biblical allusions together with examples from English folklore and contemporary literature. The allusions come to life as Coga, Lower, and King become actors in these stories. In other words, the poem includes more than just the obvious transformation of a man into a sheep. In less than a hundred verses, Coga becomes a doctor, a legendary horse, a pathetic companion of the Argonauts, Scoggin's dupe, Sancho Pansa, and

[60] The cause of death has been contested, however. See Peter Sahlins, 'The Beast Within: Animals in the First Xenotransfusion Experiments in France, ca. 1667-68,' in Sahlins, *1668: The Year of the Animal in France* (New York: Zone Books, 2017), p. 26.
[61] Howard Marchitello and Evelyn Tribble, 'Introduction,' in Marchitello and Tribble (eds.), *The Palgrave Handbook of Early Modern Literature and Science* (London: Palgrave Macmillan, 2017), xxvi.

‘silent Seneca’ (88). The experimenters undergo ‘metaplasms’ themselves as they become the Hampshire knight, incapable Jasons, deceitful Scoggins, the ludicrous Don Quixote, and Nero. In this way, satire enacts their revenge upon them as they become subjects in their own experiment.

‘On Agnus Coga’ is intended for an audience that would appreciate its quick-fire allusive humour, jokes and references, and that would enjoy the mickey-taking of the Royal Society. Judging by the manuscript in which it appears, it might have been written for court and university wits. More research is needed on similar contemporary poems on late seventeenth-century transfusions. It would be interesting to see whether other poems rely on the same sharp contrast between experimental philosophers and their subjects of study, be they human or animal. What other questions are raised in regard to this novel scientific procedure? No less importantly, in what other ways does the practice of transfusion transform poetry itself? Some of these answers can be found in the manuscript production of the period, which still remains to be studied.

On Agnus Coga his Povertie

Who by Philosophical Transfusion of Sheepsbloud became Heart-less and Shift-less, after his unpitied Addresse to the Royal Societie

That Metamorphosis did once translate
Men into Beasts, and fired by Subtle Fate
Is read, Vogue'd up again in Greshams School,
And practic'd on a Gotham-Colledg Fool,
Is now reviv'd. For by a Misterie deep
Our Fox-like Coga creeps into a sheep:
And that same Sheepishness transfusd into
His body, hath transformd him Sheepish too:
Hee's no Lycaon Wolf, Actæon Stag,
But a pure Balamite, or Sheepish Wag.
His Wits that went a Wool-gathring howere
Have scarce found Wool to stop one deafned Ear:
Less could they then to cloath his Fleece-torn hide
His thin Robes yet which were in Scarlet dide
Proclame him Doctor oth' Societie
Roial (as those who by Mandamus be)
Perhaps as wise too. Tho he now scarce knowes
How for his old to purchase newer Cloathes.
To Commence thus and want Pluralities,
Is to loose Bloud, like him, and after freeze.
Alas Poor Lamb! thy Metaplasts did lack
That Skil to make the Wool grow on thy back,
As had the Hampshire Knight whose Pegasus

When flead and cloath'd with fresh warm Sheeps-skins, thus
Reviv'd and thriv'd so wel that every year
Ten Todd of Wool at Sheering he did bear.
Could they effect the same, this Art alone
Would transcend al their Proiects. Hermes stone,
Panciroll's lost and new-found Rarities, all
Those Extracts from the Art Spagyrical,
Al the Magnetic Feats, and Golden Fleece,
Come short of Artificial Larrifice.
Linnen of Coco-nuts or Barks of Trees
(Tho such are al short of our Tinkers Freize:)
Asbestine Stuff, or Byssine, or whats made
Of Mugwort, Nettle, or such home-spun Trade.
Or comprest Atomes, or fine Gossimere
Which yet by Moderns scarce invented were,
Or Hair made grow upon an Eunichs chin,
And with that Down to quilt our Caps; had bin
More thriving Arts then Telescopes; or was
This new knack of Transfusion: but alas!
It seems these Jasons through Medeas Charms
Nor Bulls nor Dragons tam'd, or heald thy harms:
They've sowne no Dragons teeth; nor Argos fraught;
To sail in Sculler thus is Coga taught.
In which in Flanders, or from thence in Spain,
Perhaps the Golden Fleece he may obtein:

For in that brighter Orb of Charitie,
Only true Meritt wel rewarded be.
Dismantled thus (pale Ghost!) to Scoggins book
How like in Decimo Sexto dost thou look!
A Jeast and Tale al ore ridiculous?
(Mercurial Scholler!) can no Oedipus
Unfold this Riddle? In whose service He
Who lost his Bloud by them should sterved be?
They dreind thy Bloud, yet thy Wits to thy Greif
Bleed not their Pocket veins to thy Releif.
But thou perhaps maist without caus complain,
Bloud lost by Noble Valour Fame doth gain:
Thine was supplied, the Valiant's never can
Their loss of Bloud and Wants stil make them wan.
No Alchymist when al his Gold and Hope
Turn'd Smoak and Cinders; through his Microscope
Look't like his Ashes pale, as Coga doth.
Weret' warm, t'would make his bloud boil like his Breath
In's Pipkin veins: to see the lean Requite
Is made to doughtie and Puissant Wight.
When after al his best Bloud, and Coin, and Pains
Expended, He nor Cloathes nor Honour gains.
Such Pay-Masters are cruel, or scarce Good,
Who for pure Gold repay in Brass or Bloud.
Wil thy Quixotic Masters yet nought do?

Hark, Sancho! take advice and quickly too.
In their Lycæum, where they (whither right
Or wrong) run a tilt at th' old Stagirite:
How luckily placet I wis![62] the Learn'd Arras
Represents lively Balam and his Asse.
Hangt; cut it out, it il becomes that Place
Which wud Thy naked back much better grace,
With Prophet placet before, and Asse behind:
Judg (kind Spectators!) ist not wel design'd?
Better to Steal then Sterve: tis Natures Law
Thus theyl' not but their Tapstrie wear the flaw.
Ba – quoth the Lamb: I'le bleat in raggd Disdein,
Ere Ile be hang'd, or Bloud Enobled stein.
Let them stil keep their prating Asse, whilst I
With silent Seneca bleed to Death, and die.
Their Ba-lam yet not midst the Goates but Sheep
On the Right hand, so I my Station keep.

[62] 'I wis' probably stands for the adverb 'iwis,' meaning 'certainly' (cf. German *gewiss*). In the sixteenth and early seventeenth century, it was wrongly assimilated to the verb 'wis,' meaning to know (cf. German *wissen*).